6110 F40 FLYING CARS

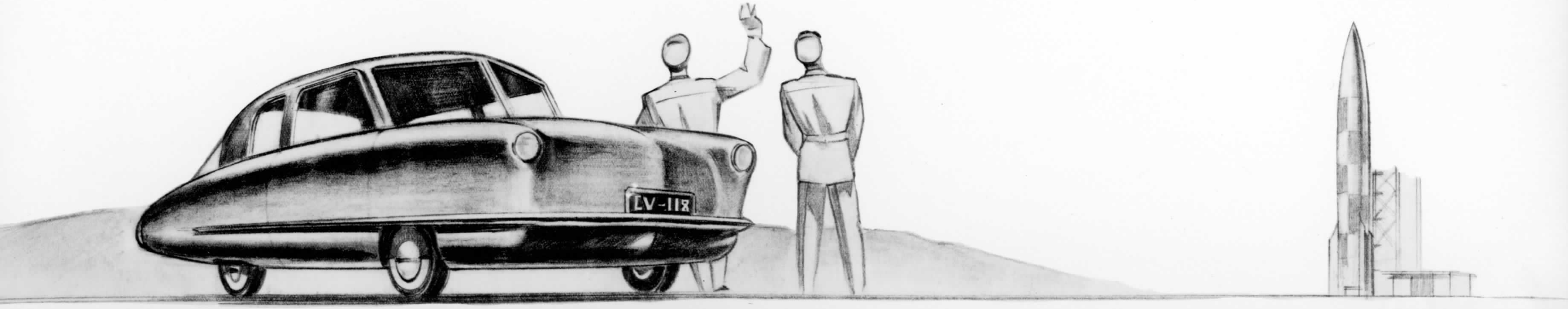
ConvAIRCAR

1948

B110 F40

Foreword

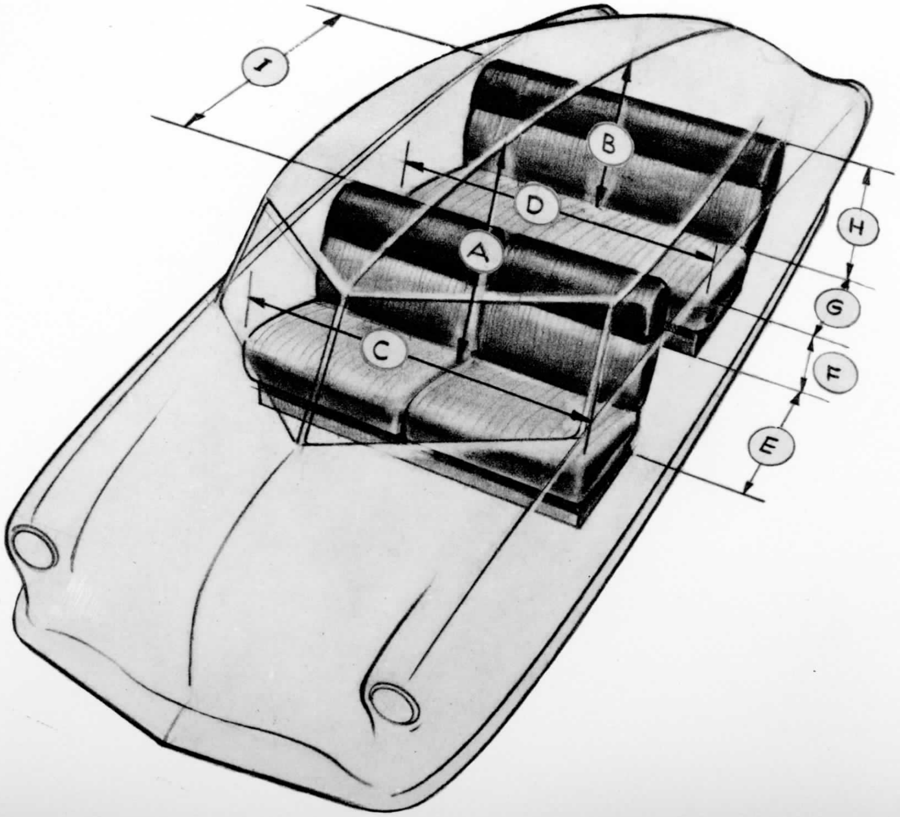
The Consolidated Vultee Flying Automobile was developed to provide to all users of automobiles and small aircraft a vehicle of maximum utility in each field of operation. The ConvAIRCAR is a proven airplane and automobile as a result of over a year's flight and ground testing to meet all CAA and automotive requirements for strength, durability, performance and comfort. The flight tests have substantiated all of the performance data herein, while road tests of the automobile have demonstrated its superior economy of operation, ease and stability in handling and big-car riding characteristics. The ConvAIRCAR has all of the advantages of a Cadillac with none of the compromises due to weight and large overall size. The only automobile that flies is in every way superlative.



Interior

Here is an automobile which embodies every refinement of automotive practice; fluid drive, wide-rim low pressure tires, hydraulic brakes, sealed beam lights, etc.,with the unique design from a structural and weight standpoint of the latest aircraft practice. Safety glass windshield and plexiglas side and rear windows combine light weight with strength where it is needed. The automobile is as ROOMY as a Cadillac, yet weighs only 725 lbs. It has a top speed of 80 mph, ACCELERATES better than the average car and climbs the steepest hills, yet it gets 45 miles per gallon with its 26 hp engine.

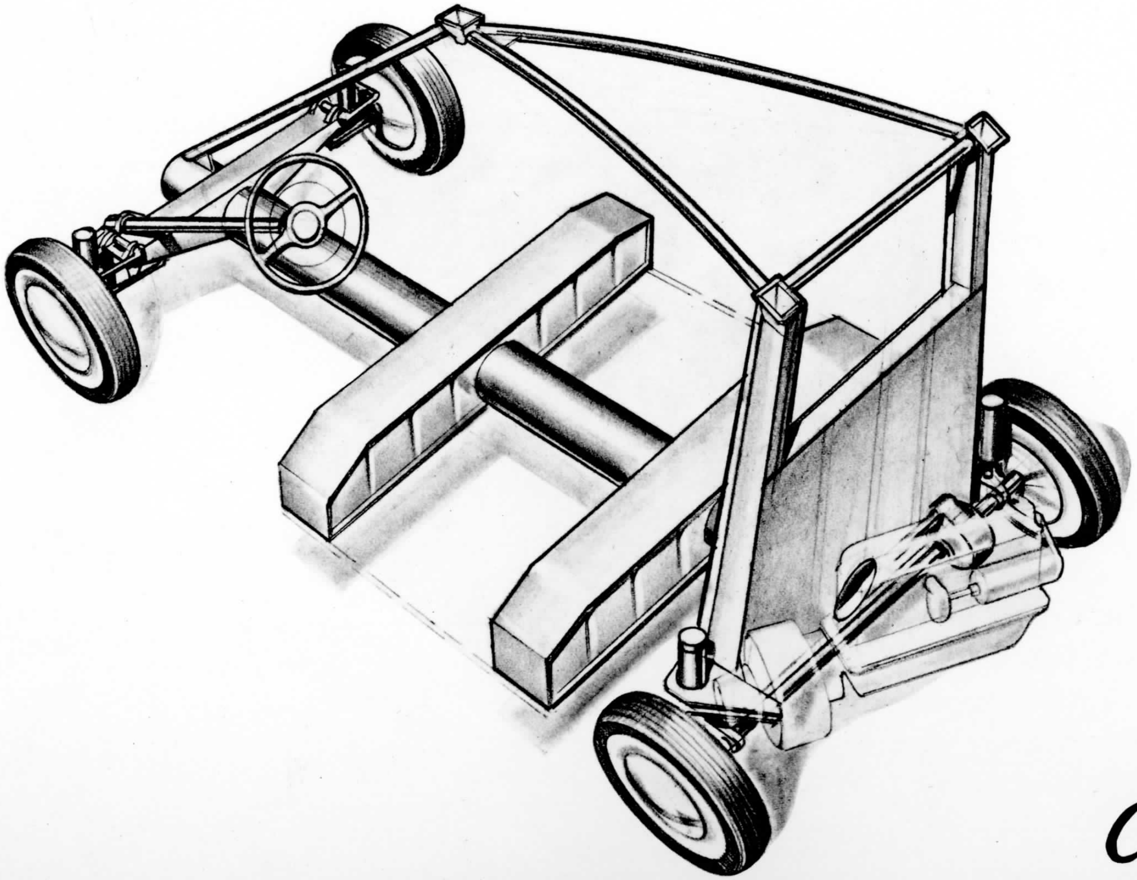
The plastic-impregnated fiberglass BODY is tougher and stiffer than steel, yet 20% lighter than aluminum. Due to the inherent sound deadening properties of the body QUIET OPERATION is possible with a minimum of added soundproofing material. The INTERIOR is finished in broadcloth and Bedford cord in matching colors. The INSTRUMENT PANEL and hardware are of satin-finish aluminum. Full carpeting is provided with rubber heel mats at the pedals. Extra large entrance DOORS with hinged-back front seat make access to front and back seats convenient. A large BAGGAGE Door forward opens into a roomy compartment. A narrow VENT door across the top visor provides extra ventilating and cooling air. All doors are SEALED with foam-rubber extrusions which stop all drafts.



Comparative Interior Dimensions

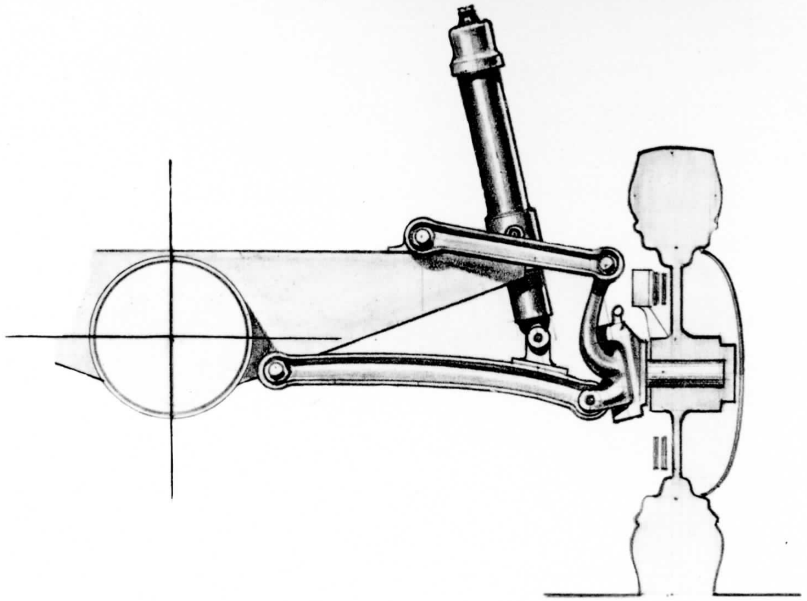
	ConvAIRCAR	Cadillac
A - Headroom Front Seat	39"	36"
B - Headroom Rear Seat	35	34
C - Seat Width - Front	54	54
D - Seat Width - Rear	54	50
E - Leg Room	16	13
F - Seat Height	13	13
G - Seat Depth	18	18
H - Back Height	21	23
I - Seat Spacing	25	28

THE STRUCTURE OF THE AUTOMOBILE IS UNIQUE IN BOTH THE AIRCRAFT AND AUTOMOTIVE FIELDS. SINGLE LARGE DIAMETER ALUMINUM ALLOY TUBES ARE USED AS THE BACKBONE OF EACH MAJOR COMPONENT. THE CHASSIS IS MADE OF ONE SUCH TUBE, TO WHICH ATTACH THE SUSPENSION POINTS, WING SUPPORTING STRUCTURE AND FLOORS AND SEATS. THE SEAT FRAMES ARE BOX-BEAMS WHICH CARRY THE PASSENGER LOAD AND ALSO SUPPORT THE FLOOR AND DOOR SILLS. THE BODY IS SUPPORTED FROM THE EDGES OF THE FLOOR AND SILLS. THE FLOOR PANELS ARE ALUMINUM ALLOY SHEETS WITH A SANDWICH LAYER OF HONEYCOMB MICARTA CEMENTED BETWEEN. THE STEEL TUBE STRUCTURE RUNNING UP THE CENTER WINDSHIELD POST AND AFT OF THE REAR SEAT WILL SUPPORT SIX AND A HALF TIMES THE WEIGHT OF THE AIRPLANE. THIS STRENGTH GIVES THE ConvAIRCAR GREATER RESISTANCE TO CAVING IN THE TOP THAN ANY STEEL BODY.



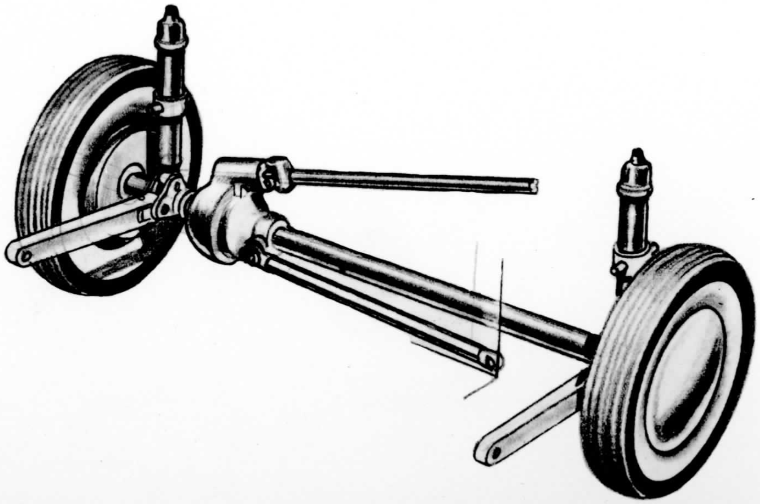
Chassis

Wheel Suspension



The FRONT WHEEL SUSPENSION reflects the newest improvements in knee-action linkages. All moving parts are rubber bushed and require no lubrication. Road shock and landing load absorption and full damping are provided in the SHOCK ABSORBER struts which were developed especially for this application. A real "boulevard ride" is provided with this simple unit by proper use of air and metered oil. The strut has only one moving part.

CENTER STEERING in conjunction with the independent front wheel suspension provides unusual stability and ease of control with a minimum of steering error. A Ross cam and lever steering gear is used.



The REAR AXLE SUSPENSION consists of similar shock struts to take vertical loads while drag loads are taken by longitudinal links pivoted from the frame. The axle is laterally positioned by a STABILIZER LINK running transversely and pivoted at each end. As in the front suspension all pivoted or moving joints are mounted on Harris RUBBER BUSHINGS which require no lubrication and isolate the car from all shock and road vibration.

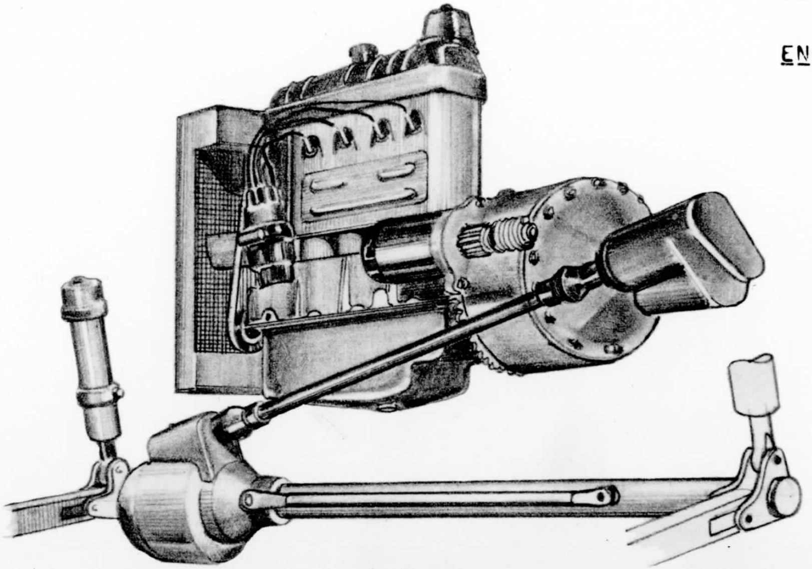
Auto Engine Installation

The automobile ENGINE INSTALLATION is a simple and efficient power package which may be removed for servicing as a complete unit through an access opening in the bottom of the car. The engine is a 26.5 BHP Crosley automobile engine. In the ConvAIRCAR it results in a displacement factor of 33.7 as compared to Cadillac's 39.6 or Ford's 33.1, and a cubic foot per ton mile rating of 206 as compared to Cadillac's 242 or Ford's 202. The engine is coupled to the TRANSMISSION by a Twin Disc HYDRAULIC COUPLING and a Borg-Warner Rockford clutch. The TRANSMISSION is a special two speed and reverse Borg-Warner silent gear synchro-mesh transmission designed to provide maximum acceleration and hill climbing power in the ConvAIRCAR. The engine is water cooled at an operating pressure of about 10 p.s.i. Automatic choke and spark advance insure consistently good engine starting and operation. The automobile 5 gallon gasoline tank is located in the luggage compartment.

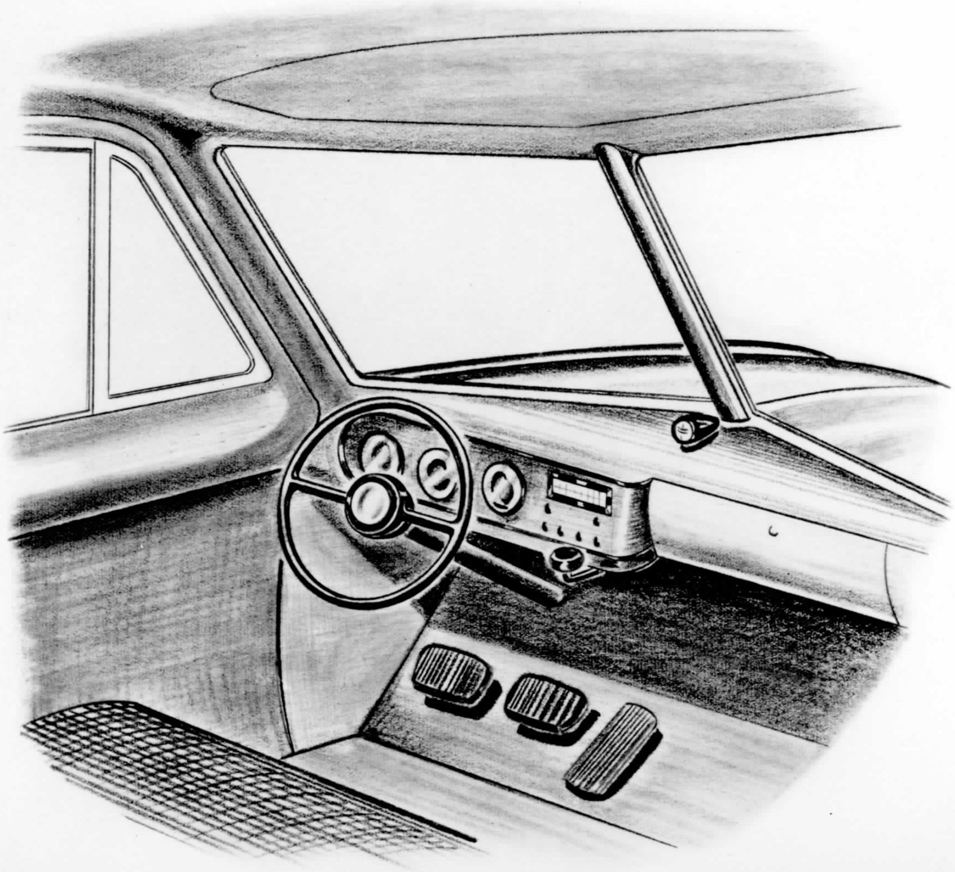
ENGINE SPECIFICATIONS

4-cylinder, overhead valve, bore 2-1/2", stroke 2¼, displacement 44 cu. in. Taxable hp 10.0, Brake HP 26.5 at 5200 rpm. Downdraft carburetor, mechanical fuel pump.

Standard Auto-Lite starter and generator, water pump, oil and air cleaner are included in engine accessories.

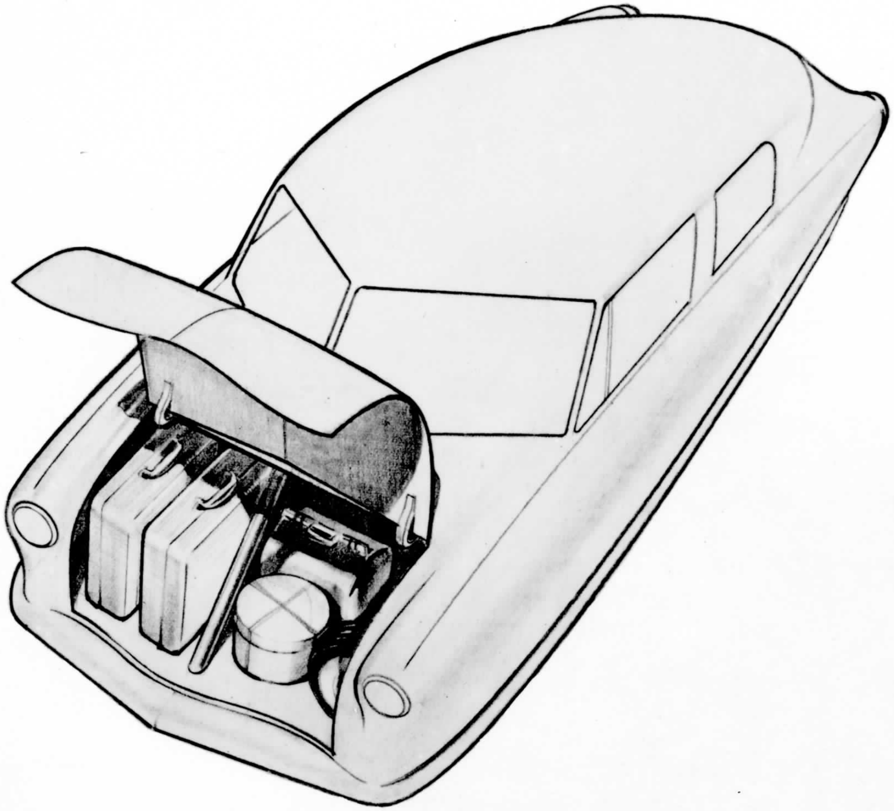


Appointments



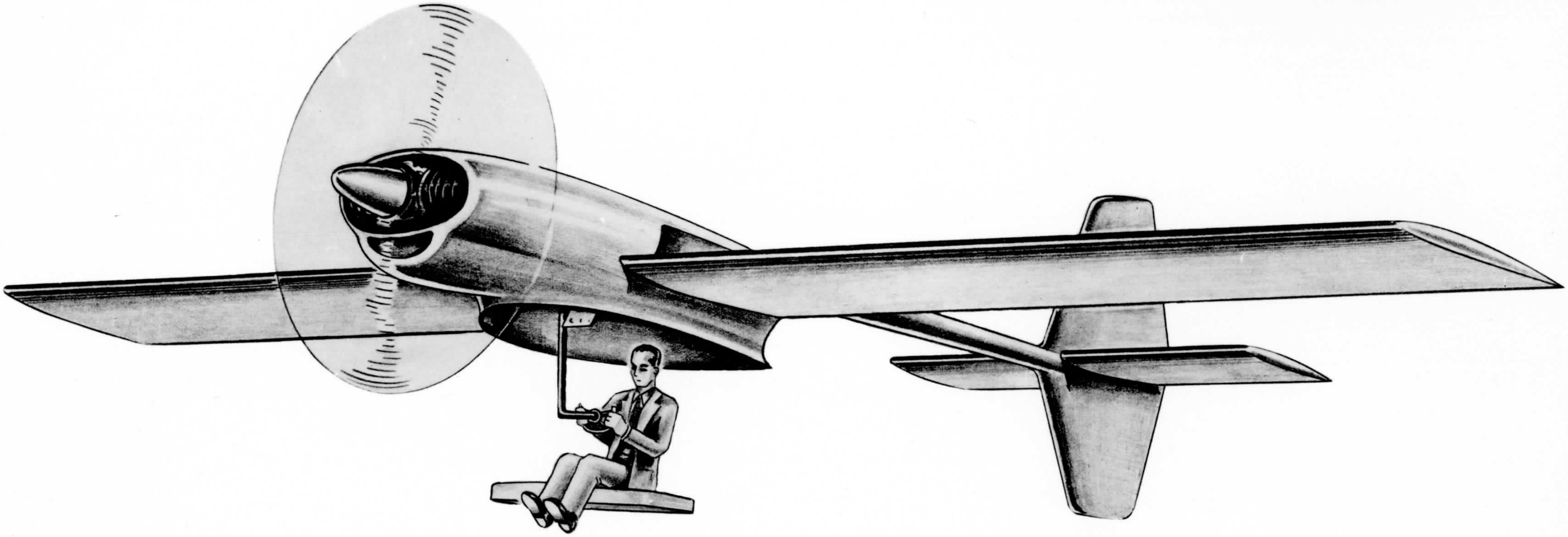
The automobile INSTRUMENTS are of Cadillac type mounted in a beautiful dashboard which includes a large glove compartment and two-way aircraft radio and broadcast receiver. A standard Trico WINDSHIELD MOTOR operates the wiper blades on each windshield pane. WINDOWS in the doors are operated from full up to full down position by a sliding handle at the bottom of the garnish molding which operates a Trico cable system. NO-DRAFT VENTILATING WINDOWS are pivoted at the forward section of each door and similar pivoted windows ventilate each side at the rear seat. The STEERING WHEEL combines strength and utility with clean design. The GEAR shift control handle is mounted in the center of the dash, convenient for the occasional shifting required for backing or steep hill climbing. FOUR-WHEEL HYDRAULIC BRAKES of the Goodyear automotive disc type stop the ConvAIRCAR smoothly and efficiently. A mechanically operated parking brake is located on the left side of the dash. The engine is serviced through a small hinged door in the right rear fender area. Outside DOOR HANDLES are of semi-flush type and operate by lifting and pulling the door open in one motion.

Features for Comfort



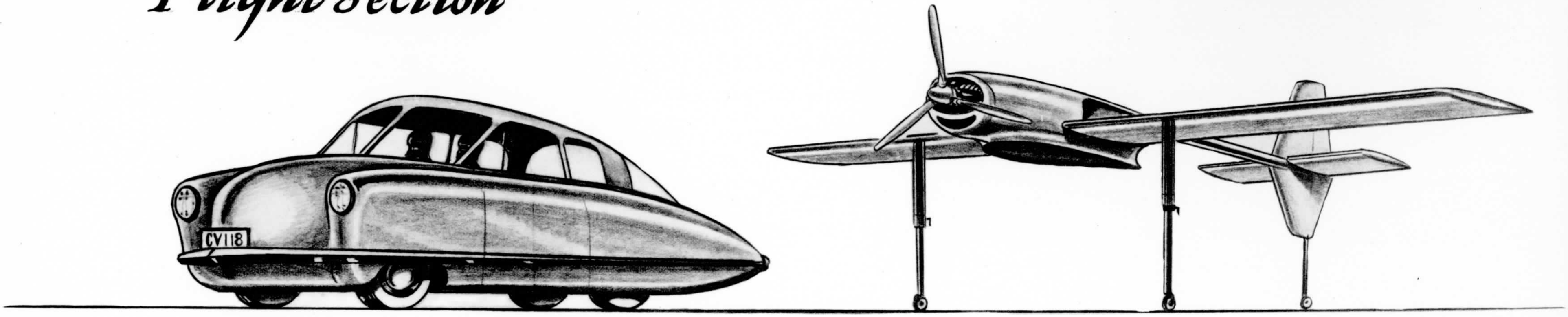
Latex foam SEAT AND BACK CUSHIONS mounted in special supporting pans are comfortable and durable. Seats are covered with broadcloth trimmed with Bedford cord. The front seat is adjustable fore and aft three inches. Sidewalls and headlining are of broadcloth backed by soundproofing panels of fiberglass. All INTERIOR TRIM garnish molding and appearance panels are of molded fiberglass with matching finish. Soft durable CARPET over a layer of soft fiberglass soundproofing presents a luxurious floor covering. The NOISE LEVEL inside the automobile is well within the range of conventional automotive quiet operation. A SPARE TIRE and wheel are carried in the luggage compartment. TIRE CHANGING is accomplished by removing wheel lugs from the hub and switching wheels. New wide rims and low-pressure tires add to riding comfort and stability.

Wing - Empennage and Power Plant



THE FLIGHT SECTION OF THE CONVAIRCAR IS A COMPLETE OPERABLE AIRPLANE IN ITSELF EXCEPT FOR A SEAT AND LANDING GEAR; INCLUDING SEPARATE POWER PLANT, INSTRUMENTS, FUEL SYSTEM, CONTROLS AND STRUCTURE. WHEN THE FLIGHT SECTION IS REMOVED FROM THE AUTOMOBILE ONLY THREE STRUCTURAL FITTINGS ARE DISCONNECTED AND ALL FLIGHT CONTROLS, POWER LINES, AND OPERATING CONTROLS REMAIN INTACT IN THE FLIGHT SECTION.

Flight Section

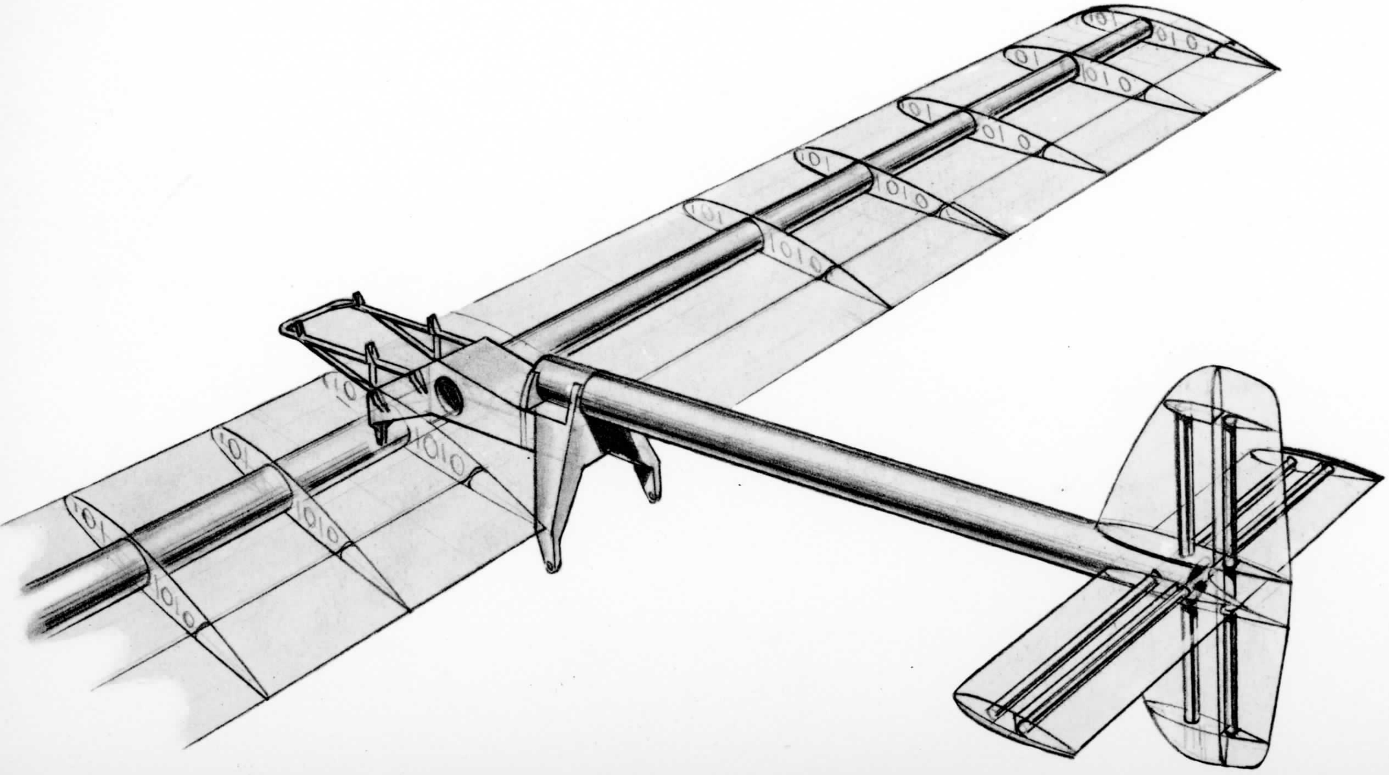


THE FLIGHT SECTION IS NORMALLY SERVICED WHILE PARKED IN THE AIRPORT AND WHILE THE AUTOMOBILE IS IN USE ELSEWHERE. ALL INSPECTION AND SERVICING POINTS ARE EASILY ACCESSIBLE THROUGH DOORS IN THE SKIN OR WITHIN THE FLIGHT SECTION FAIRING. GASOLINE AND OIL MAY BE CHECKED BEFORE THE AUTOMOBILE IS ATTACHED SO THAT WHEN THE PILOT ARRIVES AT THE FIELD HE WILL FIND THE FLIGHT SECTION READY TO GO. THE ATTACHING PROCEDURE WITH THE FLIGHT SECTION ON ITS JACKS, IS AS FOLLOWS:

(A) DRIVE AUTO INTO POSITION UNDER FLIGHT SECTION, LINING UP FORWARD ATTACHING FITTINGS BY OBSERVATION THROUGH FORWARD HATCH.
(B) LOWER WING JACKS AND STOW IN WING TIP RECEPTACLES.
(C) UNLATCH TAIL FIN JACK AND RETRACT.
(D) INSERT AND LOCK FORWARD AND AFT STRUCTURAL PINS.
(E) TELESCOPE STEERING COLUMN AND EXTEND CONTROL COLUMN.

EACH OF THE ABOVE OPERATIONS IS EASILY ACCOMPLISHED WITH LITTLE PHYSICAL EFFORT AND EACH CAN BE DONE ONLY ONE WAY. THERE IS NO POSSIBLE WAY TO DO ANY OF THE STEPS WRONG AND IF ANY STEP IS OMITTED THE INTEGRAL SAFETY FEATURES WILL NOT PERMIT STARTING THE AIRPLANE ENGINE FOR TAKEOFF. REMOVAL OF THE FLIGHT SECTION IS ACCOMPLISHED BY REVERSING THE PROCEDURE.

THE FLIGHT SECTION STRUCTURE IS EXTREMELY SIMPLE AND INEXPENSIVE TO PRODUCE, YET IT IS STRUCTURALLY EFFICIENT AND LIGHTER THAN ANY PRODUCTION AIRFRAME. ONE LARGE SEAMLESS ALUMINUM ALLOY TUBE IS USED FOR THE WING SPAR, ONE FOR THE TAIL BOOM AND SMALLER TUBES FOR THE EMPENNAGE SPARS. WING RIBS ARE ALL STAMPED FROM A SINGLE DIE AND THE TAIL SURFACES AND FLAP AND AILERON HAVE NO RIBS EXCEPT AT HINGE POINTS AND ENDS. LIGHT ALCLAD SKIN WITH CHORDWISE BEADS IS USED AS A COVERING. THE ENGINE MOUNT STRUCTURE SPLICES THE TAIL BOOM TO THE WING SPAR AND CARRIES THE FORWARD AUTOMOBILE ATTACHING FITTING. AFT OF THE SPAR THE TWO REAR AUTO ATTACHING FITTINGS ARE ATTACHED TO THE BOOM STRUCTURE. CONTROLS ARE A CONVENTIONAL CABLE SYSTEM CONNECTED THROUGH A DIFFERENTIAL LINKAGE TO THE TWO-CONTROL CONTROL COLUMN WHICH EXTENDS INTO THE AUTOMOBILE.



Structure

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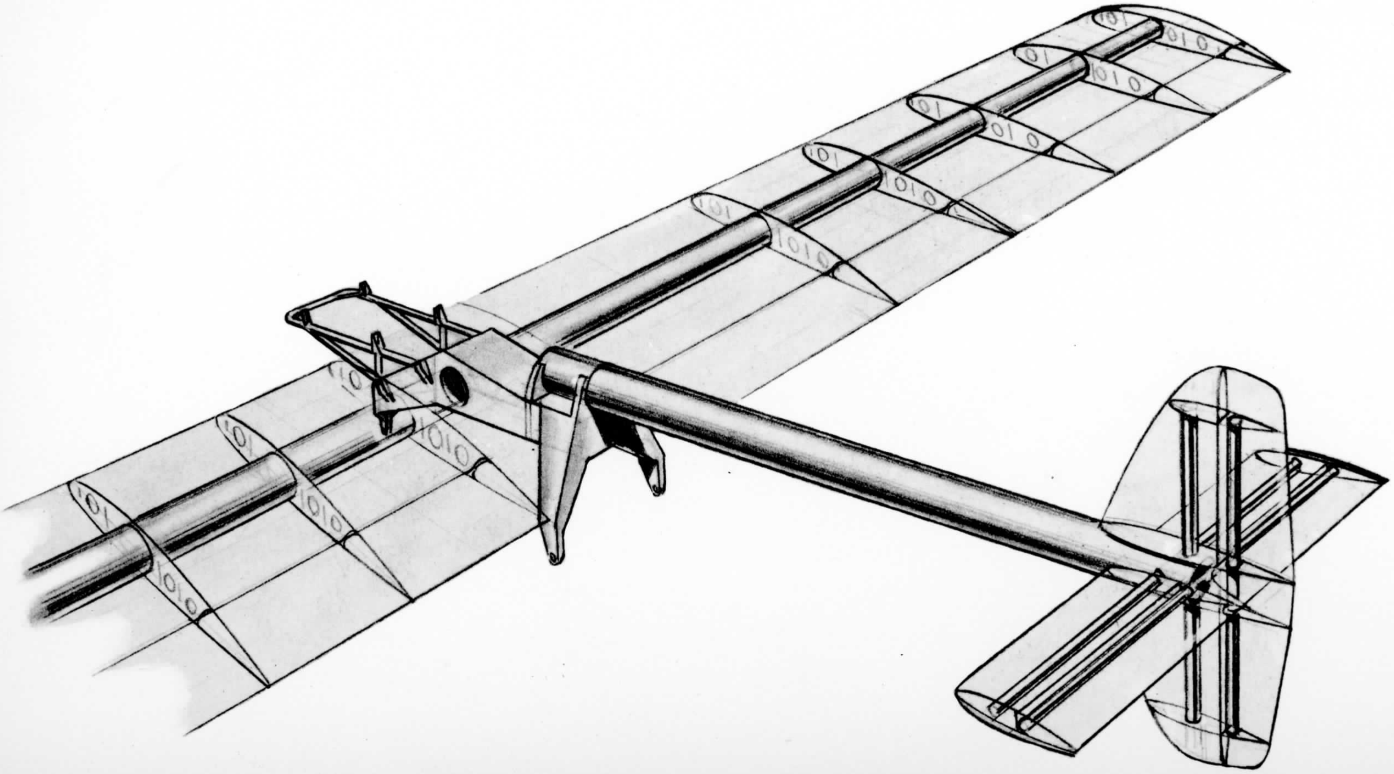
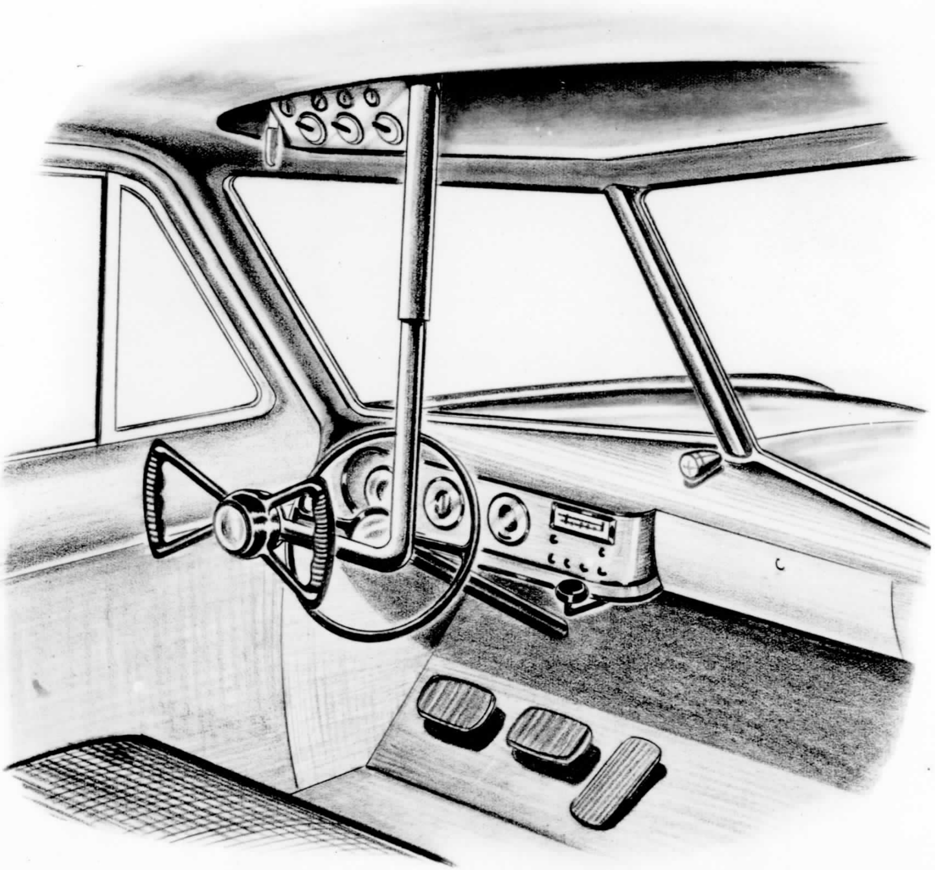


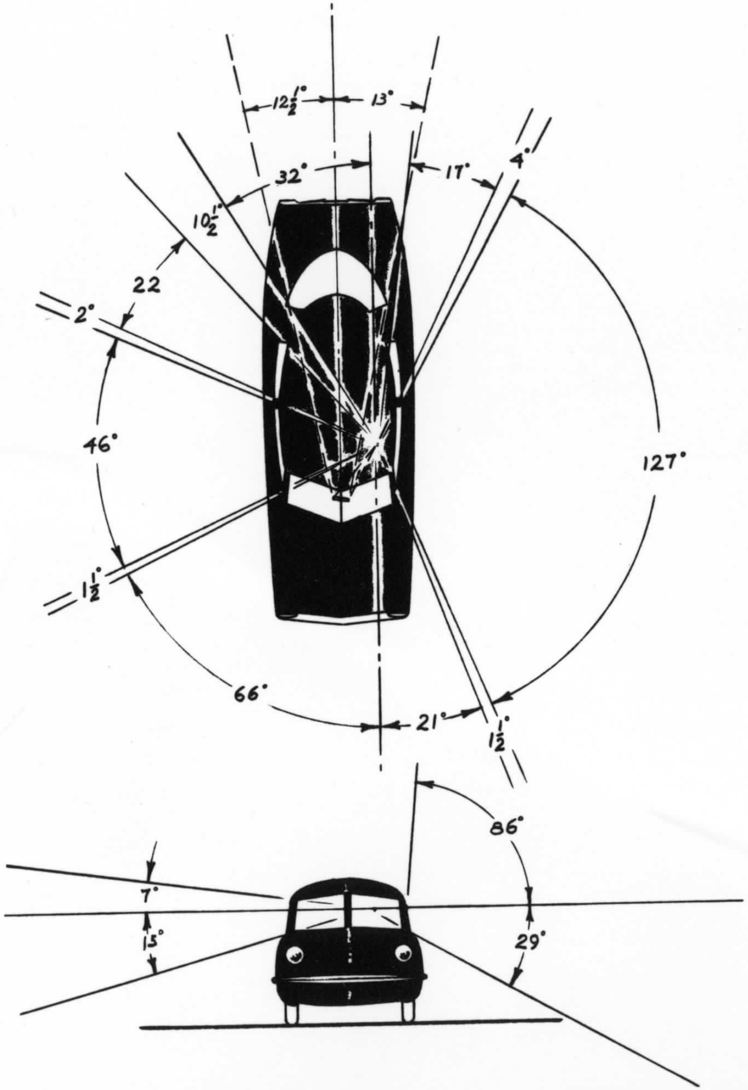
Structure

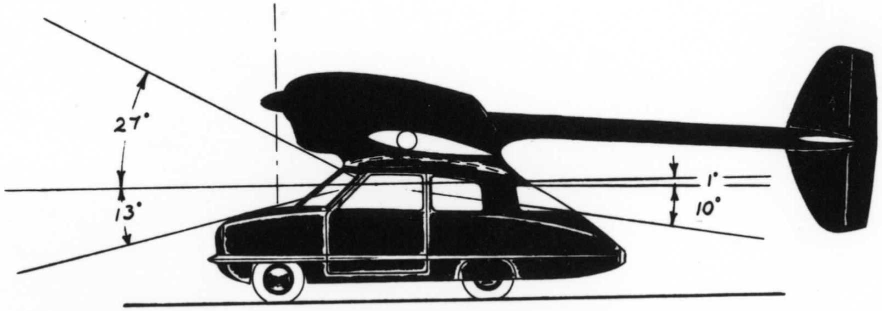
Flight Controls



FLIGHT ENGINE CONTROLS ARE ARRANGED WITH MOTORCYCLE-GRIP THROTTLE AND MIXTURE CONTROL ON THE FLIGHT CONTROL WHEEL. STARTER, IGNITION, FUEL AND OTHER SWITCHES ON THE FLIGHT SECTION INSTRUMENT PANEL. THE FLAP CONTROL HANDLE EXTENDS INTO THE CAB THROUGH THE OVERHEAD HATCH ADJACENT TO THE INSTRUMENT PANEL. A LANDING GEAR UPLATCH CONTROLLED BY A BUTTON ON THE AUTOMOBILE DASH RESTRICTS THE OLEO TRAVEL TO THE AIRPLANE STATIC POSITION. THE WHEELS ARE LOWERED TO FULLY EXTENDED POSITION PRIOR TO LANDING BY PRESSING THIS BUTTON. ALTHOUGH THE FLIGHT SECTION ELECTRICAL SYSTEM IS SEPARATE FROM THAT OF THE AUTOMOBILE, IT IS CONNECTED TO THE LATTER BY A MAIN CABLE WHICH ENGAGES AUTOMATICALLY THROUGH A BAYONET FITTING WHEN THE TWO COMPONENTS ARE MATED, SO THAT ONE BATTERY FUNCTIONS AS THE POWER SOURCE FOR BOTH UNITS. IN TURN, WHICHEVER ENGINE IS OPERATING CHARGES THE BATTERY FROM ITS SEPARATE GENERATOR. THE FLIGHT ELECTRICAL SYSTEM CONSISTS OF THE GENERATOR, STARTER, INSTRUMENT LIGHTS, NAVIGATION LIGHTS AND AMMETER.

VISIBILITY IN ALL FLIGHT AND TAXIING ATTITUDES IS EXCEPTIONAL. THE VISIBILITY AFT IN ALL DIRECTIONS IS AN UNUSUAL FEATURE UNIQUE IN A HIGH-WING AIRPLANE. THE FLIGHT SECTION ARRANGEMENT IS SUCH THAT THE NACELLE IS ENTIRELY OUT OF THE PILOT'S LINE OF VISION.





Visibility Diagram

Safety Features

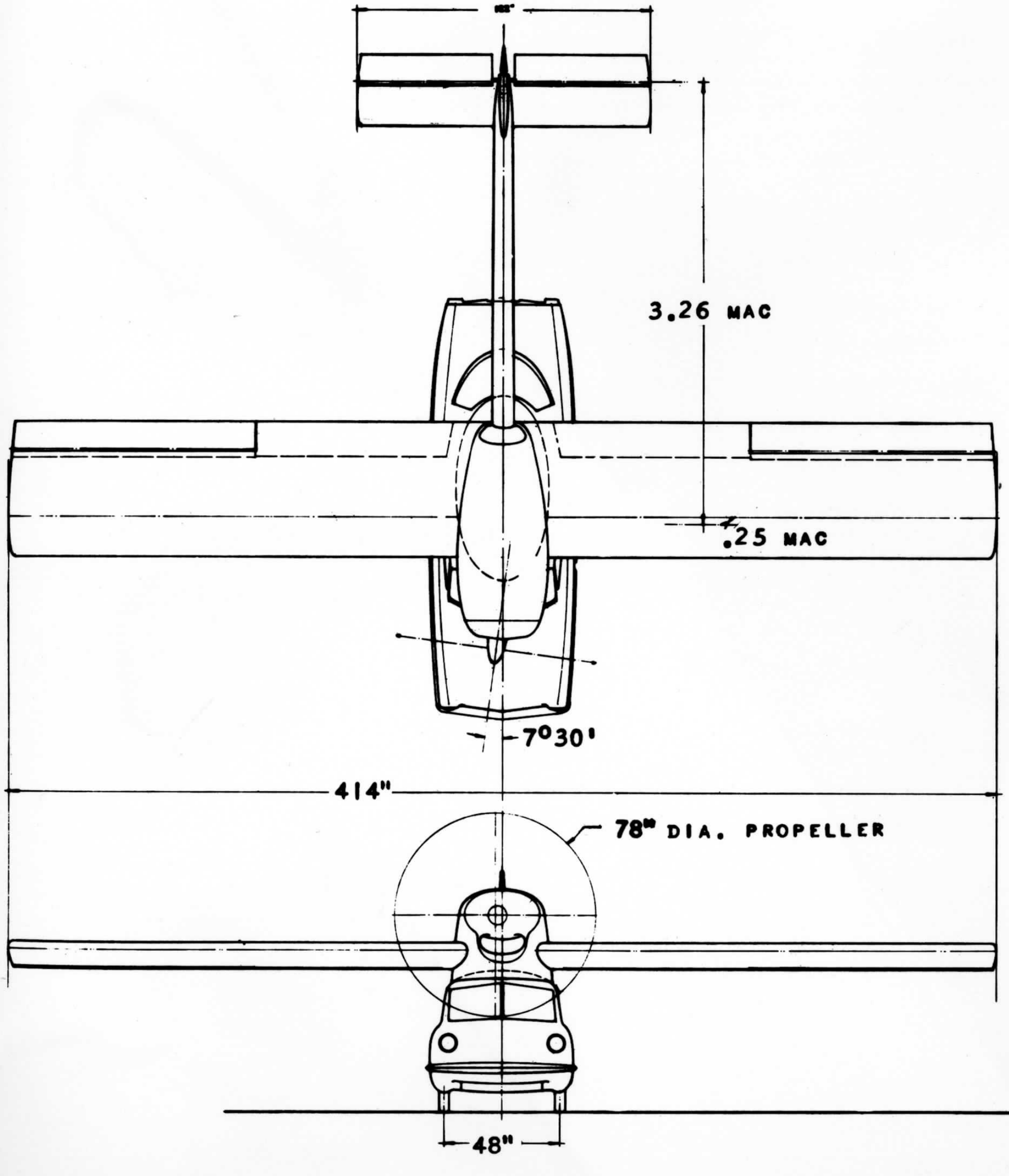
Special SAFETY FEATURES are incorporated in the auto attaching fittings. A microswitch at each of the three structural pins and connected in series with the airplane engine starter solenoid prevents starting the engine before all pins are locked in place. Each pin contains a cylinder lock actuated by the ignition key. The key cannot be removed to place in the ignition switch until each pin is locked in place. The ENGINE MOUNT structure includes an integral FUEL TANK which is easily filled through an access door in the nacelle. The Model 118 is powered for flight by a Lycoming 0-435-A six-cylinder opposed aircooled engine which develops 190 BHP at 2550 RPM. ENGINE ACCESSORIES include starter and generator. The engine is on a bed type mount and four LORD SHOCK MOUNTS. Cooling air enters the nose ring and exhausts through an aspirated system into which the exhaust manifolds also empty. A muff on one manifold provides carburetor heat and another muff provides hot air for cabin heating. The COWL is a nose ring and two piece assembly which opens easily for access to the engine section. NACELLE fairing is molded in two fiberglass sections which extend down to the top of the automobile. A soft brush type seal closes the gap between the car top and fairing. A three blade PROPELLER results in quiet, efficient operation. The flight section contains all airplane fixed equipment items and all installations are made in accordance with CAA requirements. The flight INSTRUMENT PANEL includes all standard contact instruments, airspeed indicator, altimeter, tachometer, ammeter, oil pressure gage and fuel level indicator. An aircraft compass is mounted on the automobile dashboard. The front and rear LANDING GEAR are mounted on air-oil shock struts which absorb all of the energy of rough landings without rebound and which were designed to operate effectively with the 4.50 x 12 tires on the automobile. FOUR-WHEEL HYDRAULIC BRAKES provide better braking and require little maintenance since they are designed for automotive service. When the flight section is attached the auto steering wheel is pushed forward against the dash by telescoping the steering column. GROUND STEERING is accomplished by turning the wheel in this position.

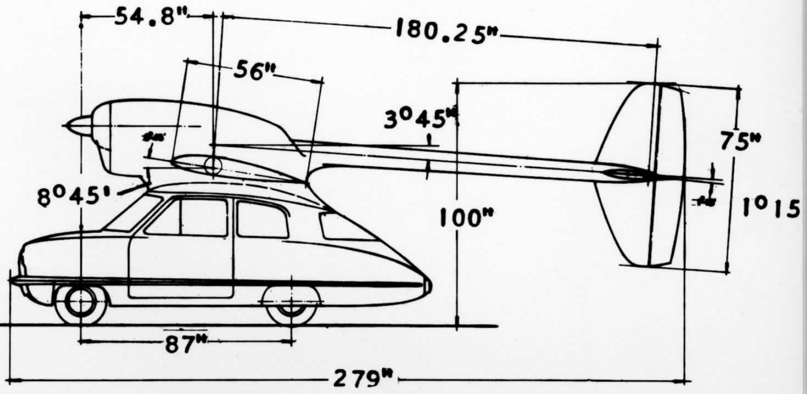
A conventional ELECTRICAL SYSTEM energizes all equipment in the automobile and spare parts are standard and procurable at any garage or service station. SEALED BEAM HEADLIGHTS provide brilliant, safe road illumination. Instrument lighting is controllable and all baggage, glove and engine compartments are separately lighted. A lightweight BATTERY of high amperage capacity provides power for the automobile electrical system and for the airplane starter. Both the automobile and airplane engine GENERATOR attach to the circuit to keep the battery fully charged. The ConvAIRCAR is VENTILATED by ram air ducted into underseat outlets. Butterfly selector valves bypass the air through a heat exchanger on the automobile engine and a muff on the airplane engine to provide HEATING through the same duct system. Hot air and ventilating air may be controlled by the butterfly valve controls on the dash. An AUXILIARY VENTILATOR is located in the top visor section in the flight section instrument and control access door which may be opened and secured at any position.

General Arrangement

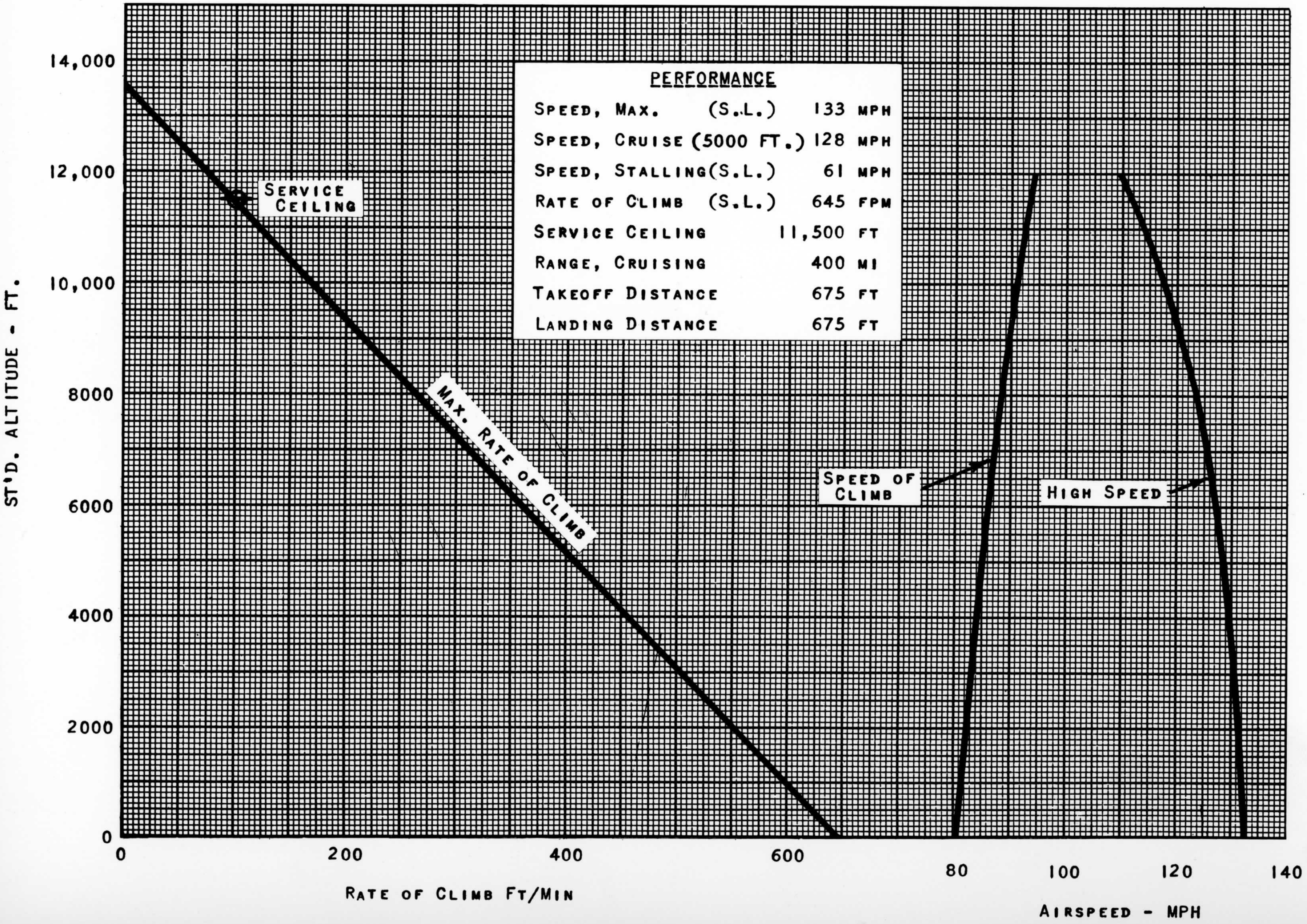
GENERAL DATA

Wing Span	ft.	34.5
Wing Chord	in.	56.0
Length Overall	in.	279.0
Height Overall	in.	100.0
Gross Weight	lbs.	2500
Wing Loading	lbs/sq.ft.	15.8
Power Loading	lbs/h.p.	13.2
Wing Area	sq.ft.	158
BHP (Lycoming 0-435)		190
RPM		2550





Performance



PERFORMANCE

SPEED, MAX.	(S.L.)	133 MPH
SPEED, CRUISE	(5000 FT.)	128 MPH
SPEED, STALLING	(S.L.)	61 MPH
RATE OF CLIMB	(S.L.)	645 FPM
SERVICE CEILING		11,500 FT
RANGE, CRUISING		400 MI
TAKEOFF DISTANCE		675 FT
LANDING DISTANCE		675 FT

PERFORMANCE AT ALTITUDE

I. MILADOON

B109 F30

CONSOLIDATED VULTEE AIRCRAFT CORPORATION
General Offices....San Diego, California

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Estimated Cost and
Selling Price -
ROADABLE AIRPLANE

3/14/47

PRELIMINARY

ESTIMATED COST AND SELLING PRICE -- ROADABLE AIRPLANE

	1,000 Units			3,000 Units			5,000 Units			10,000 Units			15,000 Units			30,000 Units		
	Cost	Selling Price		Cost	Selling Price		Cost	Selling Price		Cost	Selling Price		Cost	Selling Price		Cost	Selling Price	
		@ 25% *	@ 30% **		@ 25% *	@ 30% **		@ 25% *	@ 30% **		@ 25% *	@ 30% **		@ 25% *	@ 30% **		@ 25% *	@ 30% **
2 Place Car	$3,382	$ 5,185	$ 5,555	$1,945	$2,983	$3,196	$1,641	$2,516	$2,695	$1,368	$2,097	$2,247	$1,220	$1,870	$2,004	$1,004	$1,540	$1,650
4 Place Car	3,867	5,929	6,353	2,325	3,564	3,818	1,995	3,059	3,277	1,700	2,606	2,793	1,538	2,359	2,527	1,307	2,004	2,147
2 Place Flight Section	3,592	5,506	5,900	2,154	3,300	3,535	1,750	2,686	2,878	1,572	2,413	2,585	1,414	2,166	2,321	1,209	1,853	1,985
4 Place Flight Section	4,372	6,706	7,186	2,831	4,340	4,650	2,465	3,780	4,050	2,149	3,293	3,528	1,977	3,027	3,234	1,752	2,687	2,879
2 Place Roadable Airplane		10,691	11,455		6,283	6,731		5,202	5,573		4,510	4,832		4,036	4,325		3,393	3,635
4 Place Roadable Airplane		12,635	13,539		7,904	8,468		6,839	7,327		5,899	6,321		5,386	5,761		4,691	5,026

NOTES:

Man hours based on 80% learning curve @ 1 man hour/pound @ number 1,000 (cum. average) airframe weight of 2 place - 520 pounds, of 4 place - 720 pounds.

Labor cost based on rate of $1.35/hour.

Production expense based on rate of $1.50/hour.

General Office Admin. Expense based on rate of 10¢/hour.

Tooling based on $1,200,000 for initial tooling, with $40,000/month maintenance thereafter.

Engineering based on $800,000 for initial engineering, with $20,000/month maintenance thereafter.

Material (less engines) -- $750 for 2 place/30,000 quantity -- $1,075 for 4 plane/30,000 quantity (Stinson Voyager -- approx. $1,100).

Flight engine -- $475 for 2 place/30,000 quantity -- $775 for 4 place/30,000 quantity (Stinson Voyager -- approx. $875).

Auto engine -- $200 for 2 place/30,000 quantity -- $225 for 4 place/30,000 quantity.

Sales Expense -- $1,200,000 for 1,000 units; $1,200,000 for 3,000 units; $2,000,000 for 5,000 units; $3,000,000 for 10,000 units; $3,600,000 for 15,000 units; $4,500,000 for 30,000 units.

Profit of 15% included in selling prices.

* figured at 25% Dealer Discount.

** figured at 30% Dealer Discount.

ALH:v 3/14/47

CONSOLIDATED VULTEE AIRCRAFT CORPORATION
San Diego, California

December 20, 1946

1947 FLYING AUTOMOBILE PROGRAM

Basic Considerations

Although it is known that a high percentage of automobile sales lies in the four to six passenger field, the factors of price and early availability to the public should not be overlooked. It is generally agreed that the flying automobile will have numerous advantages from a sales point of view over the conventional automobile.

Should a program of maximum production be authorized for 1947, it is improbable that more than 1500 flying automobiles could actually be produced, considering availability of manufacturing facilities, raw materials, power plants and equipment. If the entire available productive effort of the Corporation were devoted to manufacturing flying automobiles, 30,000 units might possibly be produced by the end of 1948. If this then is the maximum possible output, we should not be concerned with the market potentialities of a 2-place versus a 4-place flying automobile, since the volume available for delivery will be only a fraction of the existing automobile coupe market.

If selling price for the automobile component is held to a minimum the automobile, for a few years, will make an ideal "second car" for many families. It should be recognized that usually a second car is used daily for driving to work, shopping, etc., in which case a larger number of passengers is not requisite.

To take advantage of the existing sellers' market requires early publicity and quick delivery to the consumer. Delay in delivery, if the trends of the past year are maintained, will result in a reduction of the number of potential buyers.

The worldwide factors of increased cost and the fact that the majority of potential buyers are rapidly consuming their savings which might be used for purchase of vehicles, were they available, indicate that the product which will find the largest sales volume in the immediate future and in any long range program will be the one offering the greatest utility at the lowest operating and maintenance cost, and which is for sale at the lowest purchase price in its field of sales competition. By opening up an entirely new market for aircraft, because of its unique all-round utility, the two-place flying automobile will exceed all other light plane sales.

Some concern has been evidenced regarding possible competition in the field of flying automobiles and it has been stated that were we to offer the 2-place flying automobile on the market, to be followed at a later date by the 4-place, that sufficient competition in the 4-place field would develop in the intervening period to seriously reduce the possibility for a profit from the 4-place vehicle. Upon closer analysis, this argument is invalid for the reasons stated above, which may be summarized thus:

(a) Basically, the 2-place flying automobile will be a low priced vehicle, while the 4-place high performance, luxury flying automobile must remain in the "Cadillac class." The 2-place unit will probably result in large volume sales for a considerable period of time.

(b) It is foolish to argue on the one hand that the 4-place automobile, or flying automobile, will tap a large percentage of the automobile market and then state that we should be concerned with the effects of competitive flying automobiles of the same class. If the 4-place flying automobile will replace the conventional automobile in even a fraction of the conventional automobile market, the fact that we have produced and marketed such a vehicle ahead of, or concurrently with, our competitors will make little difference. Our advantage lies in the fact that we now have a product which is the result of several years development of which nearly all of the fundamental art has been mastered and proven in flight tests and road tests. It is inconceivable that any other manufacturer could arrive at the same stage of development within the next two years.

Proposed Program for 1947 and 1948

It is proposed to complete the development of the 2-place flying automobile, Model 116, by the middle of February 1947. Concurrently an extensive tooling program should be undertaken to provide manufacturing tools for all parts except the few small items which may be changed as a result of the road tests. Fortunately, the major tooling required for this article consists of dies for the car structure, body skin and flight surfaces. None of these parts will be changed as a result of the road test findings.

With the establishment of a pilot line in June 1947, it should be possible to produce between 1500 and 2000 units by the end of the 1947 fiscal year. Continued refinements in tooling and reductions in manhours per airplane should result in the production of a total of 30,200 units by the end of the 1948 fiscal year.

To reach the low priced field the combined automobile and airplane could be sold for a consumer's price of $2,765 (including all Corporation costs, 15% profit and 25% dealer's discount). This program would show a net profit to the Corporation of $6,500,000 as of November 30, 1948, and as early as October 15, 1947, operation would be breaking even.

To take advantage of the future possibilities of volume sales of 4-place flying automobiles the 4-place article should be developed concurrently with the 2-place production program. The year 1947 would be devoted to development including complete wind tunnel, flight and road tests.

Production tooling could be started upon completion of the flight tests for components such as flight section structural parts, fuselage structure and body skin. It should be possible then to start production early in 1948 and to anticipate the manufacture of 1000 units during that year. At this quantity the 4-place flying automobile would sell for $7,626, including all costs, 15% profit and 25% dealer's discount.

The 1947 development program including the manufacture and testing of six automobiles and three flight sections and the manufacture of a considerable portion of the production tooling would cost $1,840,000. The program would break even toward the end of 1948 to show a profit early in the second year of production.

To implement this program authorization should be granted to start the necessary work for production immediately.